Alliance Cycle-Heating Domestic Heat Pump Water Heater R410 - Technical Manual



Applicable Models:

ALLWH3.2kW R410
ALLWH5.0kW R410
ALLWH7.2kW R410

Alliance reserves the right to discontinue, or change at any time, specifications or designs without notices and without incurring obligations.

Contents

Part 1
General Information

Model Names of Outdoor Units

Outdoor Units

Model name	Dimension (mm)	Net/Gross weight (kg)	Power supply
ALLWH3.2 KW	Width: 790 Height: 736 Depth:260	54/57	220~240V-1ph-50Hz
ALLWH5.0 KW	Width: 790 Height: 736 Depth:260	62/66	220~240V-1ph-50Hz
ALLWH7.2 KW	Width: 845 Height: 945 Depth:335	81/86.5	220~240V-1ph-50Hz

External Appearance

Outdoor unit

ALLWH3.2 KW

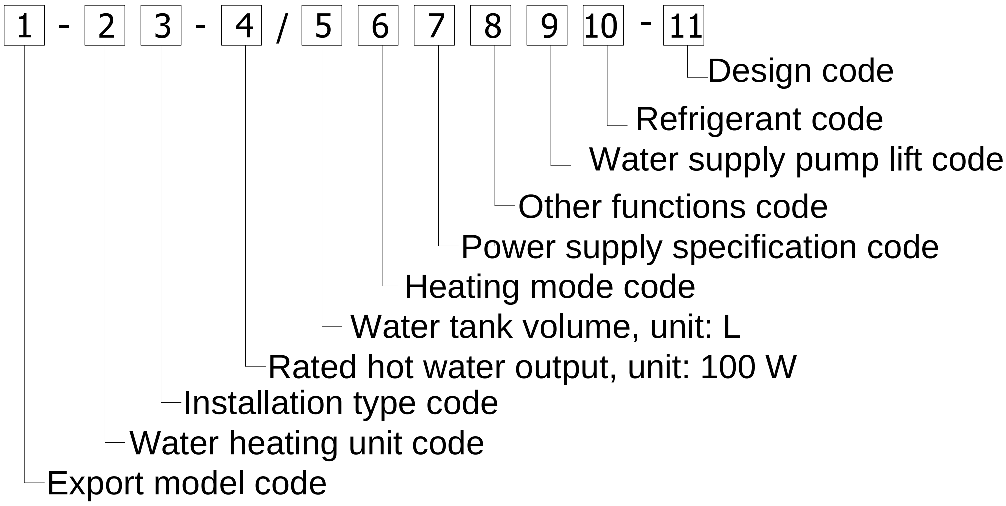
ALLWH5.0 KW

ALLWH7.2 KW



Nomenclature

Household water heating unit



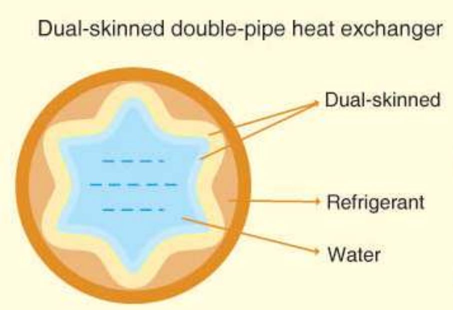
4. Features

4.1 Safety

a. Ensure there is isolation between water and electricity to avoid possibility of electric shocks

b. Unit not to be mounted adjacent to fuel tanks or pipes to avoid potential danger from oil leakage, fire, explosion etc.

4.2 Double wall heat exchanger built in main unit



■ **Dual-skinned double-pipe heat exchanger is available, and it's the best way to prevent refrigerant leakage.**

■ **R410A is available.**

4.3 R410a gas, Environmental protection.

a. No discharge of poisonous gas.

b. No pollution to atmosphere and environment

4.4 Max. water temperature: 60℃.

4.5 Rapid heating of water.

4.6 Easy operation and automatic control.

The system can be controlled simply through the wired controller.

Automatic start-up, shutdown and automatic defrosting saves extra manual operation.

4.7 High efficiency and energy-saving.

The unit uses heat pump principle, which absorbs heat from outdoor air and produces hot water. Thermal efficiency can be approximately 4.0.

4.8 All-weather running.

Designed to operate between temperatures ranging from -7 to 43°C, the Alliance heat pump heats at night and during periods of overcast sky, rain and snow.

4.9 Convenient installation and maintenance

The quadrate type is highly compact and can be easily installed in narrow areas

4.10 Wilo water pump built into the main unit.

4.11CE approval

Part 2
Outdoor units

1. Specifications

Model			ALLWH3.2 KW	ALLWH5.0 KW	ALLWH7.2 KW
Power supply		Ph-V-hz	1-220-50	1-220-50	1-220~240-50
Water Heating	Capacity	kW	3.0	4.3	6.5
	Input	kW	0.81	1.11	1.6
	Rated current	A	3.7	6	7.3
Max. input consumption		kW	1.55	1.85	2.55
Max. input current		A	7.5	6	11.1
Starting current		A	19.2	27.4	36.8
Compressor	Model		PA118M1C-4FZ2	PA160X2C-4FT	PA240X2CS-4KU1
	Type		Rotary	Rotary	Rotary
	Brand		Toshiba	Toshiba	Toshiba
	Supplier		MIDEA-TOSHIBA (Guangdong)	MIDEA-TOSHIBA (Guangdong)	MIDEA-TOSHIBA (Guangdong)
	Capacity	kW	2.88	3.91	5.8
	Input	kW	1.03	1.35	1.99
	Rated current(RLA)	A	4	5.8	9.3
	Locked rotor Amp(LRA)	A	19.2	27.4	36.8
	Thermal protector		INNER	INNER	INNER
	Capacitor	uF	25	35	50
	Refrigerant oil	ml	350	480	750
outdoor fan motor	Model		YDK36-6R-1	YDK36-6R-1	YDK65-6N
	Brand		Welling	Welling	Welling
	Input	kW	0.08	0.08	0.125
	Capacitor	uF	3.5	3.5	3
	Speed(hi/lo)	r/min	775/510	775/510	830/450
outdoor coil	a.Number of rows		1.5	2	2
	b.Tube pitch(a)x row pitch(b)	mm	25.4X22	25.4X22	22X22
	c. Fin spacing	mm	1.8	1.8	1.4
	d.Fin type		Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outer dia.and type	mm	Φ9.52 innergroove tube	Φ9.52 innergroove tube	Φ7.94 innergroove tube
	f.Coil length x height x width	mm	772X484X44	772X484X44	802X660X44
	g.Number of circuits		5	5	5

Outdoor air flow		m3/h	2000	2000	3200
Outdoor noise level		dB(A)	49	55	55
Outdoor unit	Dimension (W*H*D)	mm	790×736×260	790×736×260	840×940×324
	Packing (W*H*D)	mm	905×807×355	905×807×355	965×1009×395
	Net/Gross weight	kg	54/57	62/66	81/86.5
Refrigerant type/Quantity		kg	R410A/0.95	R410A/1.2	R410A/1.3
Design pressure		MPa	4.4/2.2	4.4/2.2	4.4/2.2
Refrigerant piping	Liquid/ Gas side	mm	/Φ9.52	/Φ9.52	Φ7.94/Φ12.7
	Max. pipe length （water）	m	5	5	5
Max. difference in level of the unit and tank		m	3	3	3
Ambient temp		℃	-7℃-43℃	-7℃-43℃	-7℃-43℃
water pipe	Diameter, water inlet pipe	mm	DN20	DN20	DN20
	Diameter, water outlet pipe	mm	DN20	DN20	DN20
	Diameter, water circulating pipe	mm	DN20	DN20	DN20
Wire Controller			KJR-26B/GWE	KJR-26B/GWE	KJR-26B/GWE
Hot Water Yield		m^3/h	0.516	0.86m	1.12
Water outlet temp.		℃	40℃～60℃	40℃～60℃	40˚C～60˚C

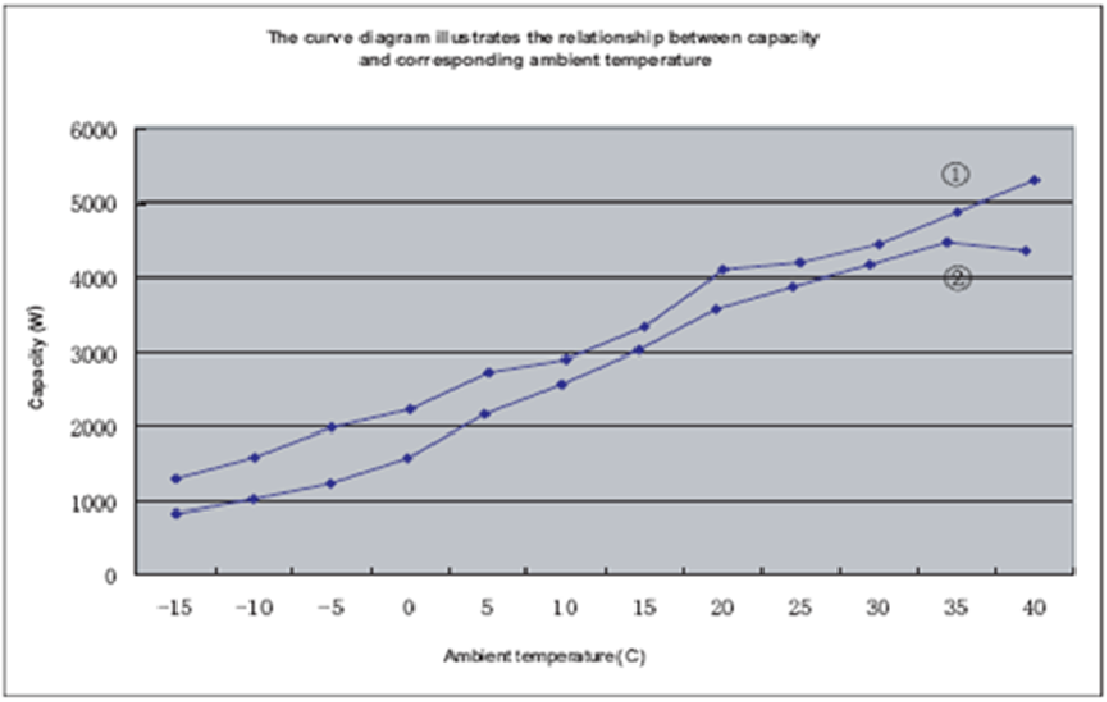
Remark:

1. The test conditions: outdoor temp.7.0/6.0℃ (DB/WB), inlet water temp. 30℃, outlet water temp. 35℃.
2. The operation range:-7℃-43℃.
3. Specifications may change due to product improvements. Please refer to the nameplate.

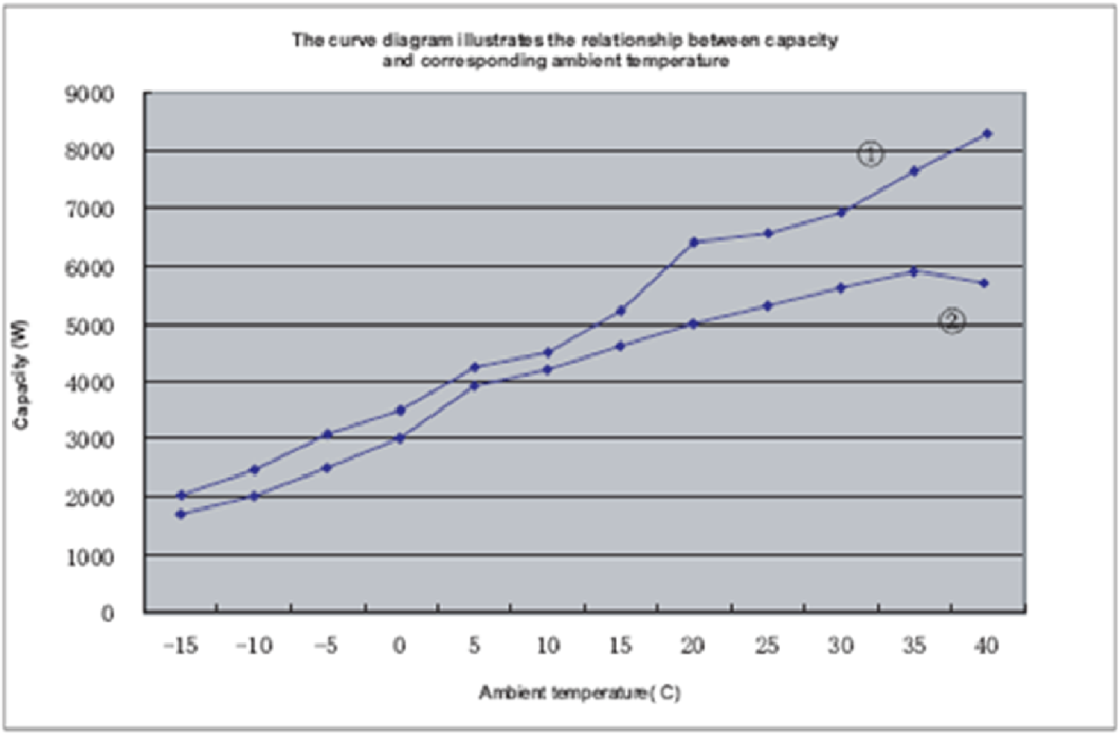
2. Relationship between Outdoor Ambient Temperature and Unit Capacity

Heat Pump Models:

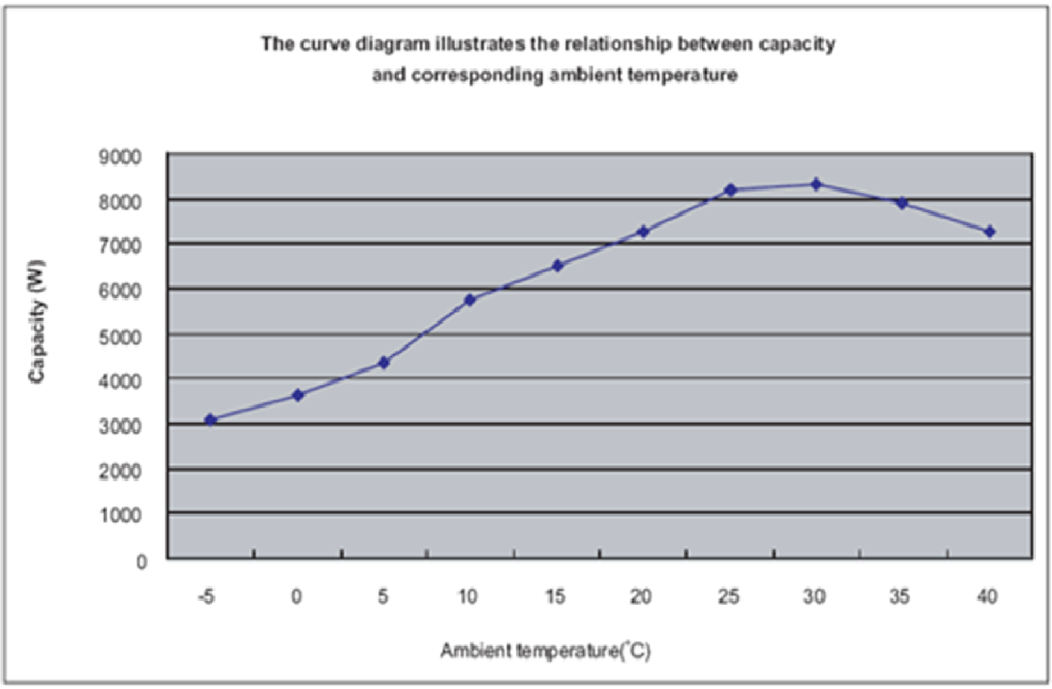
ALLWH3.2 KW



ALLWH5.0 KW



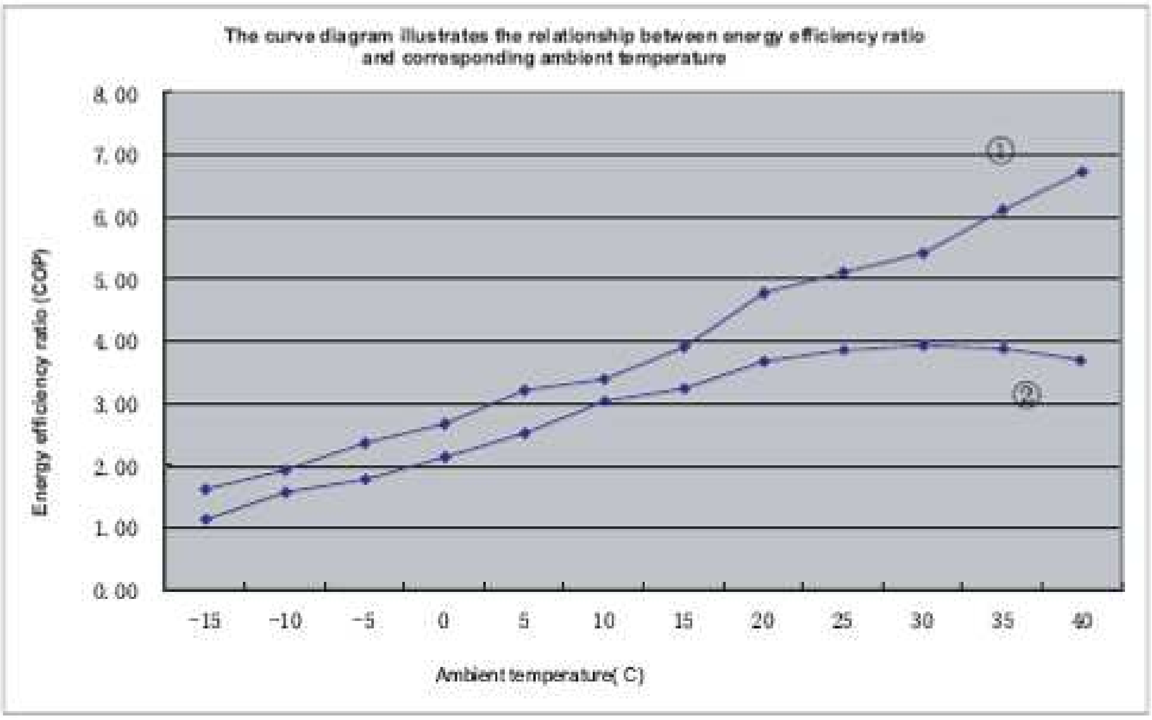
ALLWH7.2 KW


The curve diagram illustrates the relationship between capacity
and corresponding ambient temperature
Capacity (W)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-5
0
5
10
15
20
25
30
35
40
Ambient temperature(˚C)

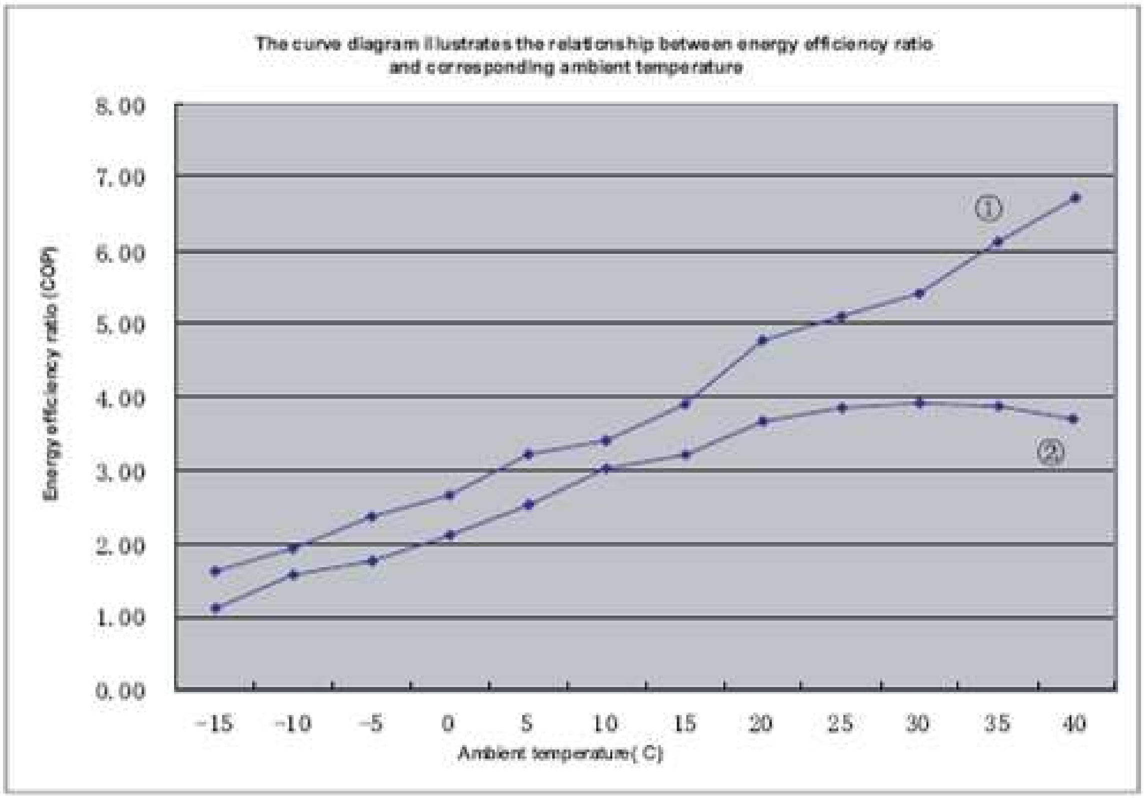
3. Relationship between Outdoor Ambient Temperature and COP

Heat Pump Models:

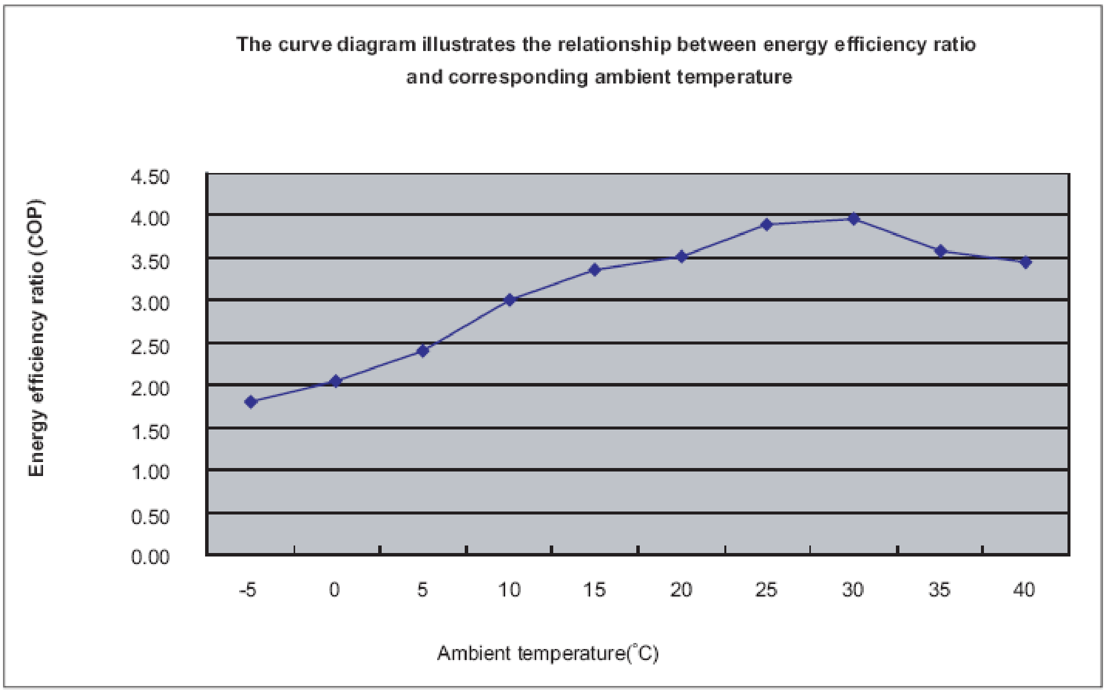
ALLWH3.2 KW



ALLWH5.0 KW



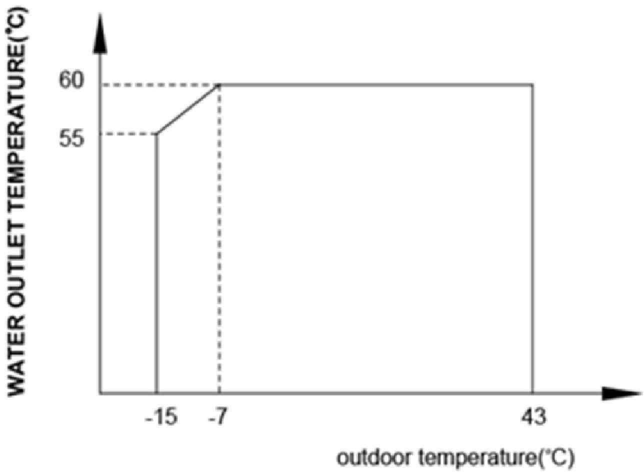
ALLWH7.2 KW



The curve diagram illustrates the relationship between energy efficiency ratio and corresponding ambient temperature
Energy efficiency ratio (COP)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-5
0
5
10
15
20
25
30
35
40
Ambient temperature(˚C)

4. Relationship between Outdoor Ambient Temperature and Outlet Water Temperature

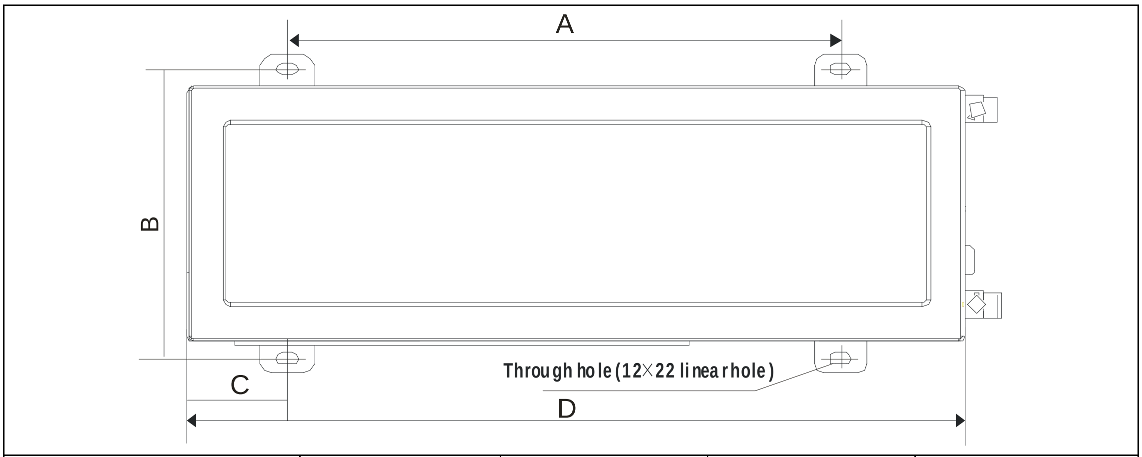
Model 32, 50 , 72



Note:

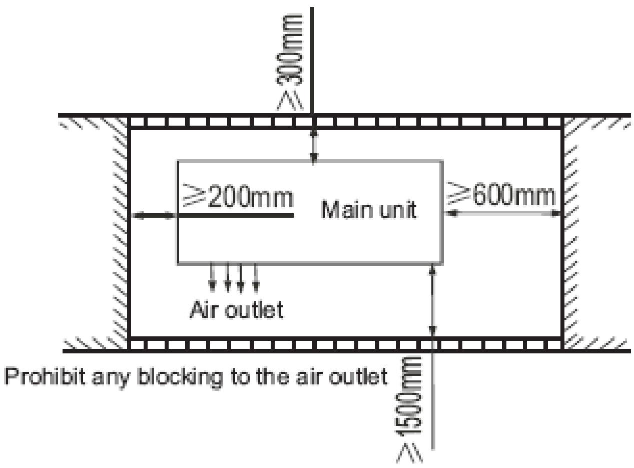
The unit outlet water temperature is under full-automatic control and the water tank is the pressure type. When hot water is being drawn off, cold water will enter the water tank, thus decreasing the temperature. Taking into account usage patterns, hot water amount (above 40 ℃) should account for 90% of the tank volume.

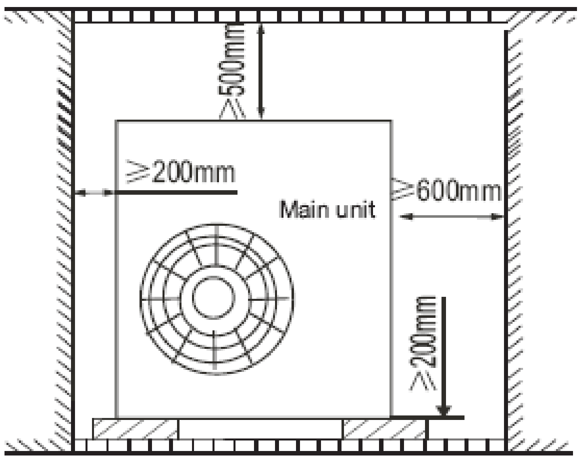
5. Main Unit Foundation Bolt Dimensions



MODEL	A	B	C	D
ALLWH3.2 KW	563	295	100	790
ALLWH5.0 KW	563	295	100	790
ALLWH7.2 KW	560	335	140	845

6. Service Space

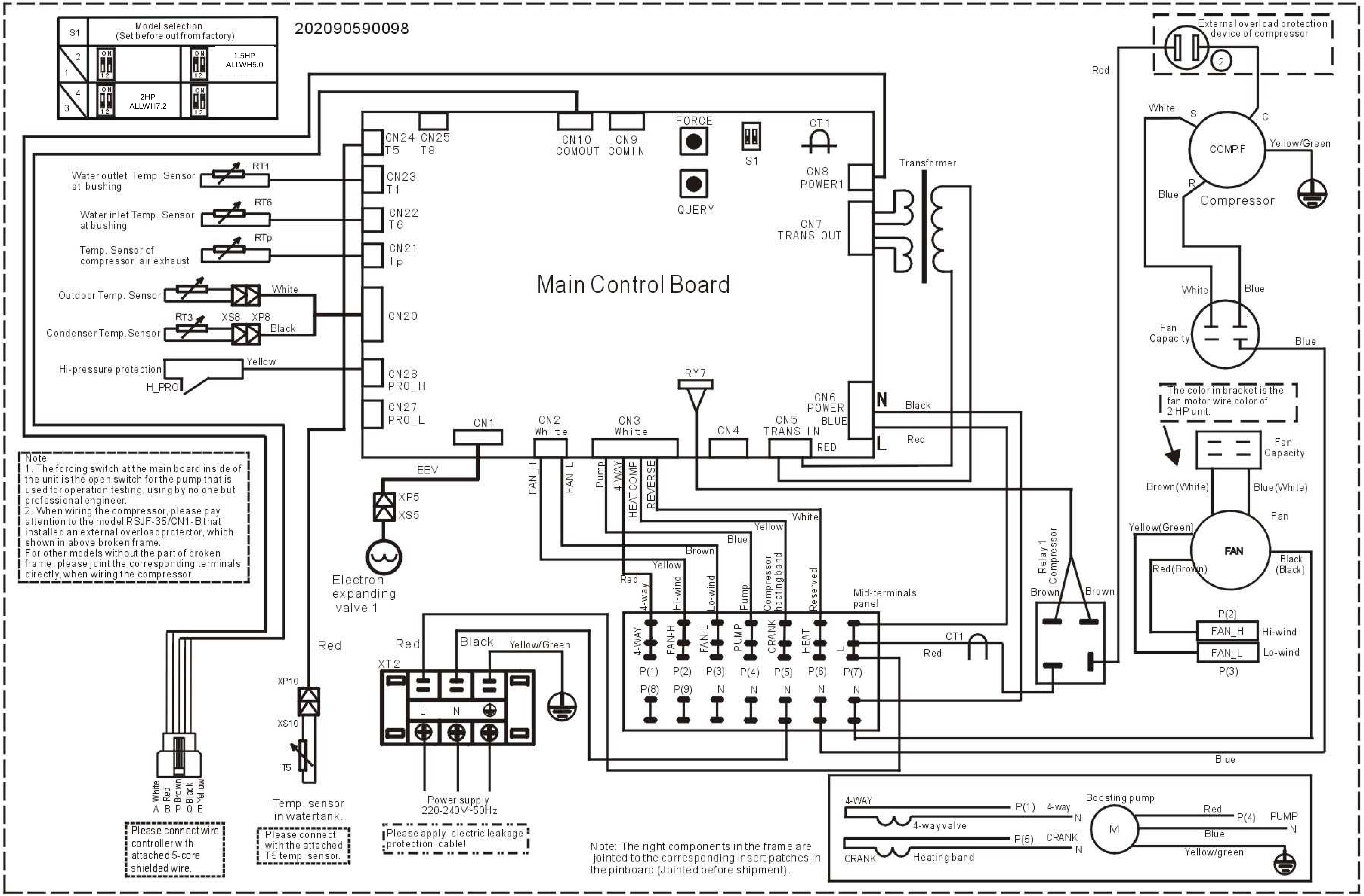




7. Wiring Diagrams

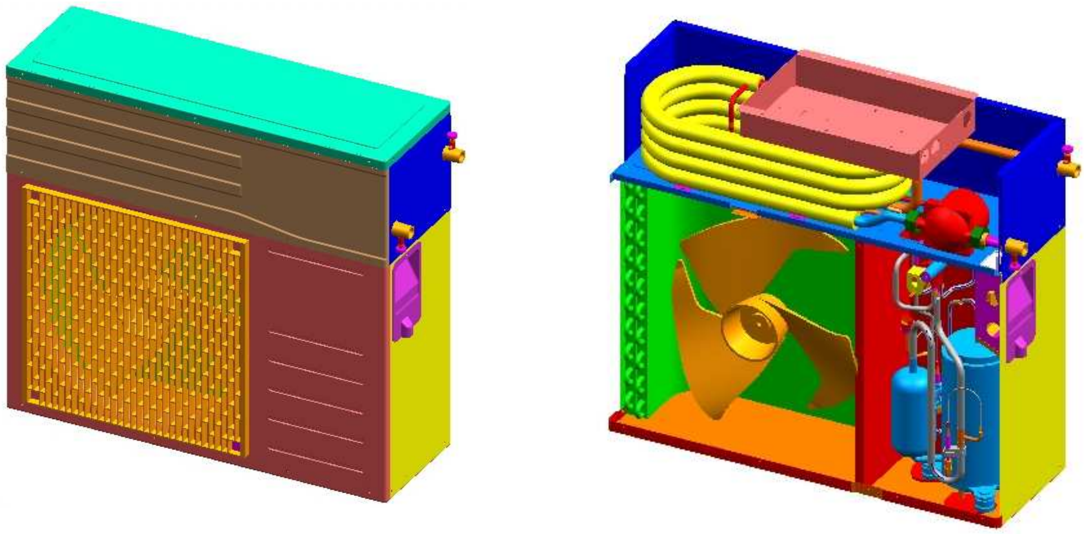
ALLWH3.2

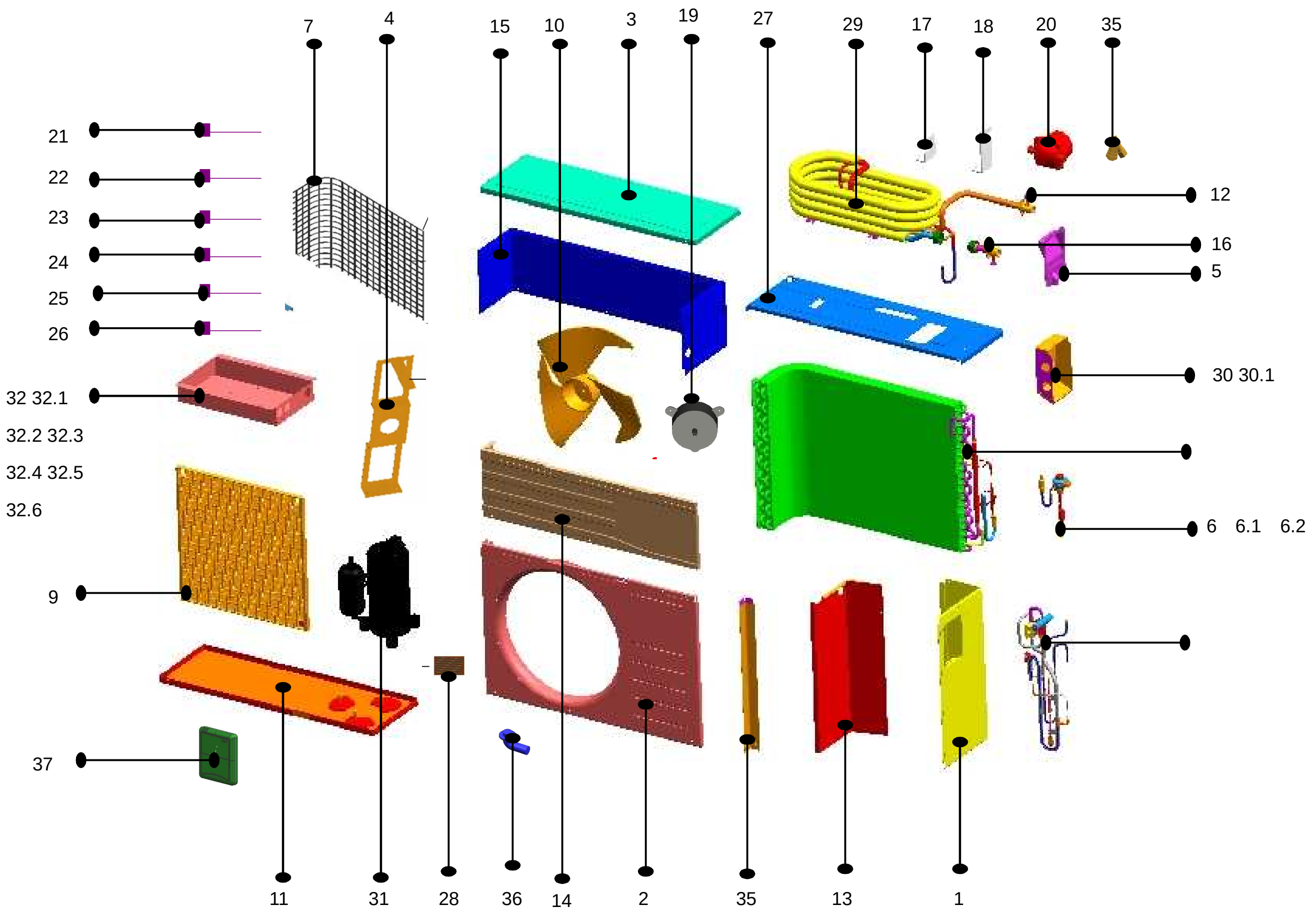
ALLWH3.2KW ALLWH5.0 KW ALLWH7.2 KW

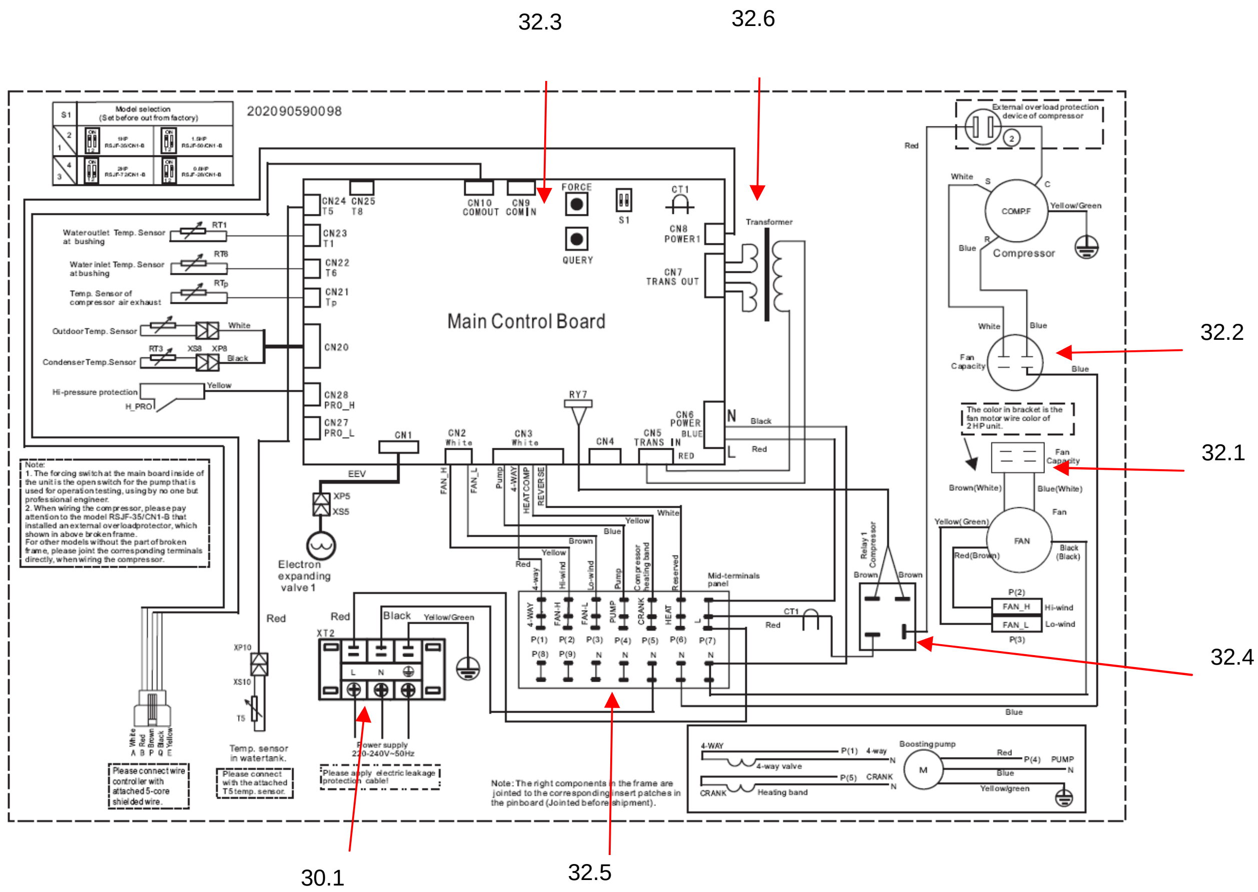


8. Exploded View

ALLWH3.2 KW & ALLWH5.0 KW



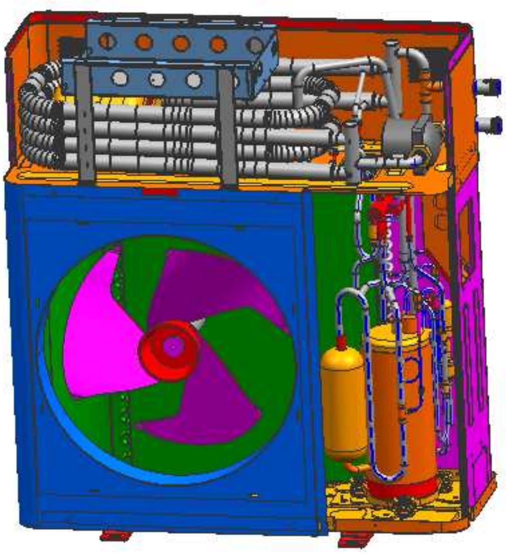


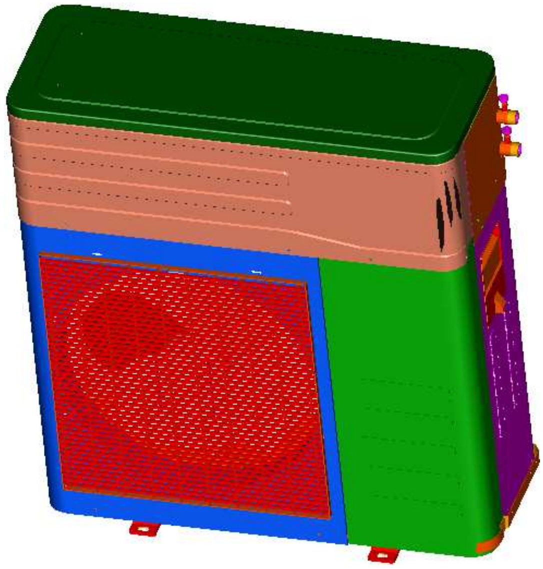


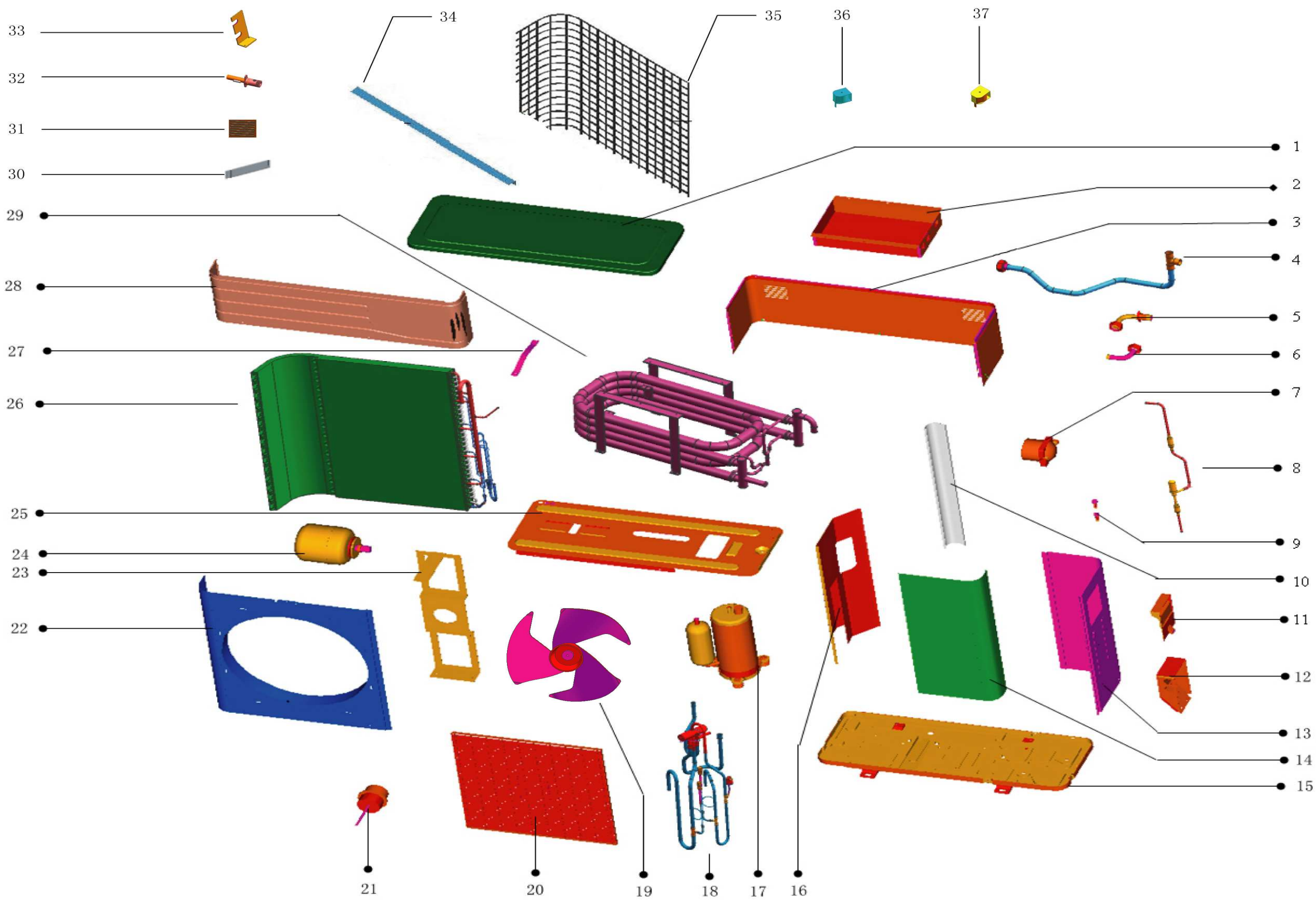
No.	Part Name	Quantity
1	Rear right clapboard ass'y	1
2	Front panel	1
3	Top cover	1
4	Motor bracket	1
5	Big handle	1
6	Throttle ass'y	1
6.1	Electronic expansion valve	1
6.2	EEV solenoid	1
7	Rear net	1
8	Condenser ass'y	1
9	Grille	1
10	Axial flow fan	1
11	Base ass'y	1
12	Drain pipe adapter	2
13	Middle partition plate	1
14	Side board	1
15	Side board	1
16	Adapter ass'y	1
17	Holder Ⅰ	1
18	Holder Ⅱ	1
19	Motor	1
20	Shield pump ass'y	1
21	Temp sensor	1
22	Temp sensor	1
23	Temperature sensor	2

No.	Part Name	Quantity
24	Temp.sensor ass'y	1
25	Compressor electric heater	1
26	Discharge temp sensor ass'y	1
27	Partition board	1
28	Waterproof net ass'y	2
29	Shell and tube exchanger ass'y	1
30	Terminal installation box	1
30.1	Wire joint	1
31	Compressor	1
32	E-part box ass'y	1
32.1	Motor capacitor	1
32.2	Compressor capacitor	1
32.3	Main control board ass'y	1
32.4	Relay	1
32.5	Middle connection board ass'y	1
32.6	Transformer	1
33	4-way valve ass'y	1
33.1	Four-way electro-magnetic reversing valve	1
33.2	Solenoid	1
33.3	Pipe joint	2
33.4	Pressure controller	1
34	Left supporter	1
35	Strainer	1
36	Drain hose	1
37	Wire controller	1

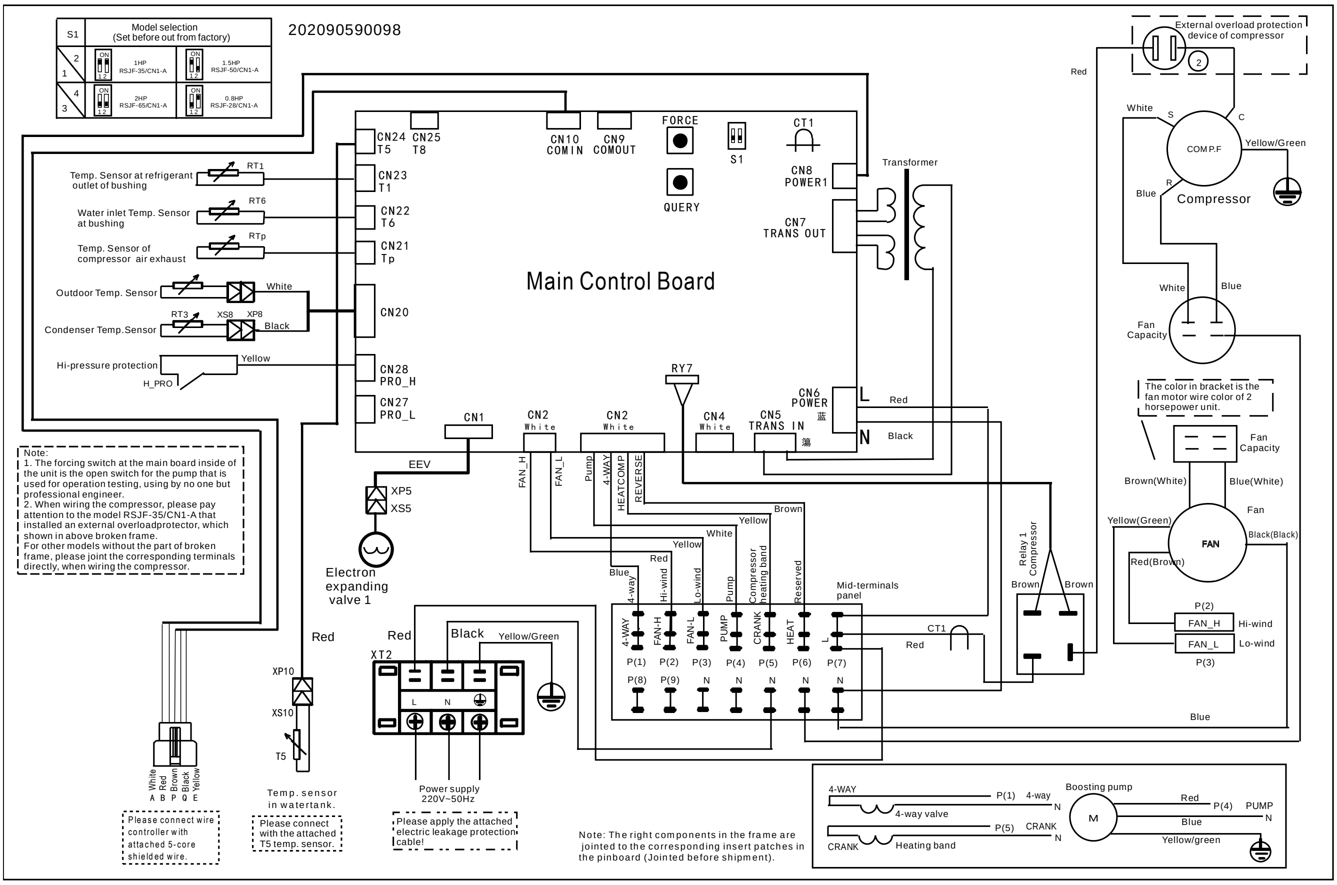
ALLWH7.2kW





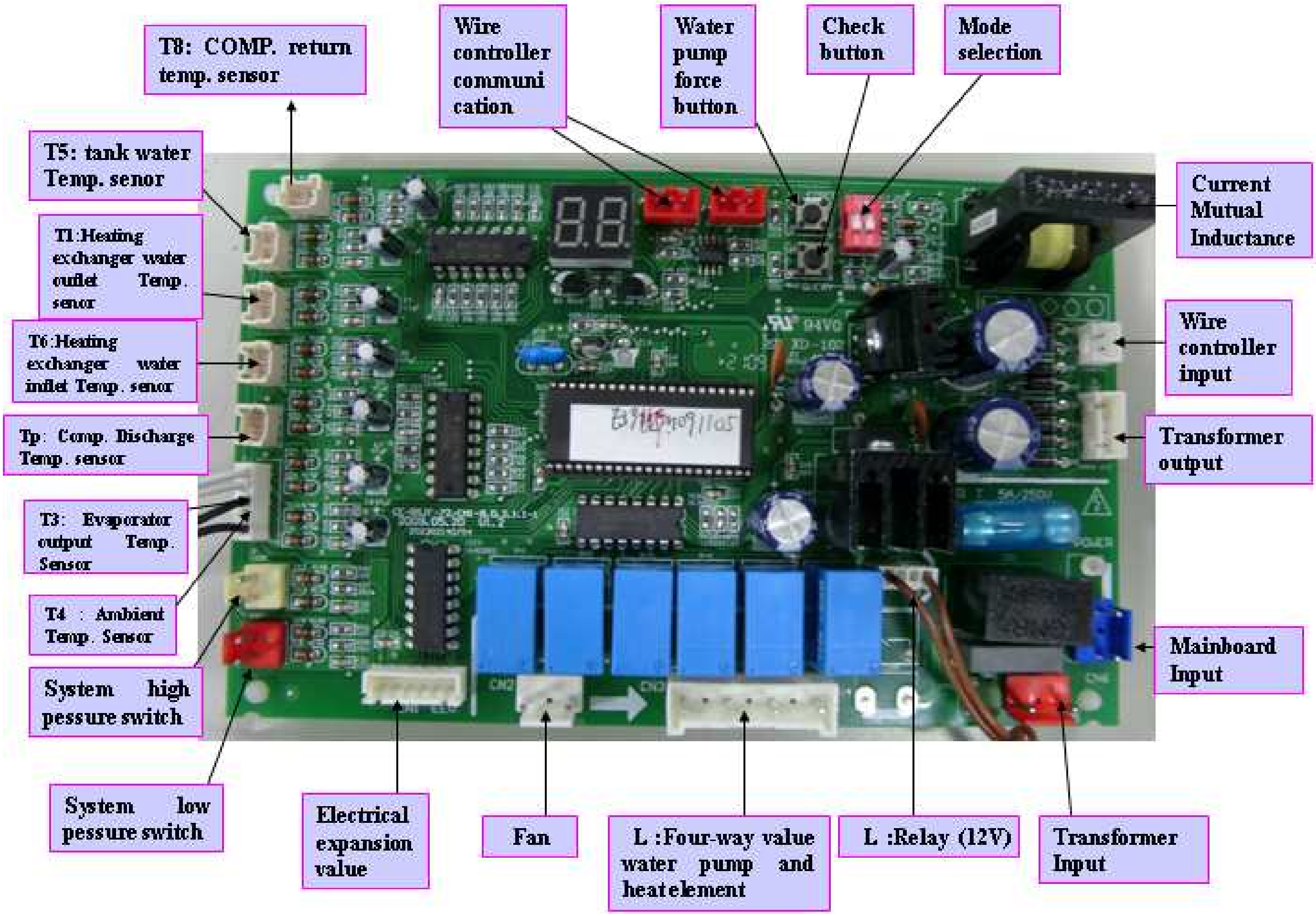


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37



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Cover	1	19	Axial flow fan	1
2	E-part box ass'y	1	20	Grille	1
2.1	Main controller ass'y	1	21	Motor	1
2.2	Motor capacitor	1	22	Front panel	1
2.3	Compressor capacitor	1	23	Motor bracket ass'y	1
2.4	Relay	1	24	Expansion vessel	1
2.5	Middle connection board ass'y	1	25	Up partition board ass'y	1
2.6	Transformer	1	26	Condenser ass'y	1
2.7	E-part box	1	27	Expansion vessel clap	1
3	Side board	1	28	Side board	1
4	Expansion vessel connection pipe ass'y	1	29	Tube-in-tube heat-exchanger	1
5	water inlet pipe ass'y	1	30	Name Plate	1
6	Water inlet ass'y	1	31	Waterproof net ass'y	2
7	Shield pump ass'y	1	32	Drainage water pipe ass'y	1
8	Electronic expansion valve ass'y	1	33	Bracket	1
9	Drain pipe adapter	2	34	Rear net frame	1
10	Left holder	1	35	Rear net	1
12	Terminal installation box	1	36	EEV solenoid	1
13	Rear right clapboard	1	37	4-Ways valve solenoid	1
14	Front right clapboard ass'y	1	38	Small handle	1
15	Base ass'y	1	39	Drain hose	1
16	Partition board ass'y	1	40	Wire controller	1
17	Compressor	1	41	Temperature sensor	2
18	4-way valve ass'y	1	42	Temp sensor	1
18.1	4-way valve	1	43	Temp sensor	1
18.2	Pressure controller	1	44	Temp.sensor ass'y	1
			46	Compressor electric heater	1

9. PCB explantation



Part 3
Installation

1. Precautions

- Be sure to conform to local, national and international laws and regulations.
- Read "PRECAUTIONS" carefully before installation. They include important safety items.
- Keep this manual with the owner's manual for future reference.

The safety precautions listed here are divided into two categories. As these are important, please read them both carefully.

WARNING:

(Failure to observe the warnings below could result in fatal injury)

Only trained and qualified service personnel are to install, repair or maintain the equipment.

Improper installation, repair or maintenance may result in electric shock, short-circuits, leaks, fire or other damage to the equipment.

The unit must be installed strictly according to these installation instructions.

Defective installation could cause water leakage, electric shock or fire.

Ensure that the attached accessories and specified parts are used for installation, otherwise water leakage, electric shock or fire may result.

The unit is to be installed on a suitably strong wall able to withstand the unit's weight. An improperly done installation may result in damage to the unit or the unit becoming detached from its mountings.

The enclosure of the appliance is to be marked by word or symbols, indicating direction of fluid flow.

For electrical work, local and national wiring standards are to be adhered to. An independent circuit and single outlet must be used.

Improper connection or fixing may cause overheating or fire at the connection point.

Routing of wiring must be properly carried out, and the control board cover fixed in place. An improperly fixed control board cover may cause overheating at terminal connection points and fire or electric shock.

If the supply cord is damaged, it must be replaced by the service agent or other qualified person in order to avoid a potential hazard.

An all-pole disconnection device which has at least 3mm separation distance in all poles and a residual current device (RCD) with a rating above 10mA must be incorporated in the fixed wiring according to national regulations.

In areas prone to strong winds, typhoons or earthquakes, consideration must be taken into account during installation.

If any refrigerant leak occurs during installation, ventilate the area immediately.

As the temperature of refrigerant pipe will be high, please keep the interconnection cable away from it.

After completion of installation, check for any leakage of refrigerant.

Toxic gas may be produced if refrigerant leaks into an enclosed room and comes into contact with a source of fire such as a fan heater, stove or cooker.

CAUTION

Failure to observe the cautions listed below may result in injury, or damage to the equipment.

After the installation is completed, make sure that the unit is operating properly during the trial operation.

Please instruct the customer on how to operate the unit and keep it maintained. Also, inform customers to keep this manual for future reference.

The water heater must be earthed.

Do not connect the earthing wire to gas or water pipes, lightning rod or a telephone earthing wire. Incomplete earthing may result in electric shocks.

Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electric shocks.

First connect the outdoor unit wires before connecting the indoor unit wires.

Do not connect the power supply to the units until final wiring and piping of the units is done.

Be sure to install drain piping in order to ensure proper drainage, and insulate piping in order to prevent condensation. Improper drain piping may result in water leakage and property damage.

Young children should be supervised to ensure that they do not play with the appliance.

Don't install the heat pump in the following locations:

- Where petrolatum exists.
- Directly exposed to salty air (near the coast).
- Where caustic gas (e.g sulfide) exists in the air (near a hot spring).
- In areas of excessive vibration (e.g. as can occur in factories).
- Inside buses or cabinets.
- Inside kitchens
- Where strong electromagnetic waves exist.
- In close proximity to inflammable materials, gas, acids or evaporating alkaline liquids.

2. Installation information

- Before installation, please read this manual first.
- The HPWH must be installed by qualified personnel.
- When installing the tank and piping, please follow this instruction manual as strictly as possible.
- If the HPWH is installed on a metal part of the building, it must be electrically insulated according to the relevant standards of electrical appliances.
- When all the installation work is finished, turn on the power only after a thorough check.
- This manual is subject to changes due to technological improvement without further notice.

INSTALLATION ORDER

- Select the location
- Install the outdoor unit;
- Install the water tank
- Install the connecting pipe
- Connect the drain pipe
- Connect wiring
- Test operation.

3. Accessories

Please check whether all the following fittings are included. If any are missing, be sure to obtain them before proceeding with installation.

Name	Qty	Application
1. Installation and User Manual	**1**	——
2. Y type filter	**1**	Inlet water filter
3. Wire control assembly	**1**	Controls the units and display units status
4. Seal ring	**1**	Seals the drain pipe
5. Drain connecting pipe	**1**	Main unit condensed water drainage
6. Water tank temperature sensor	**1**	Water tank temperature check

Cautions on remote controller installation:

Treat controller with care; do not mishandle or drop it.

Before installation, operate the remote controller to determine its location in terms of reception range.

Keep the remote controller at least 1m apart from the nearest TV set or stereo equipment (necessary to prevent image disturbances or noise interference.)

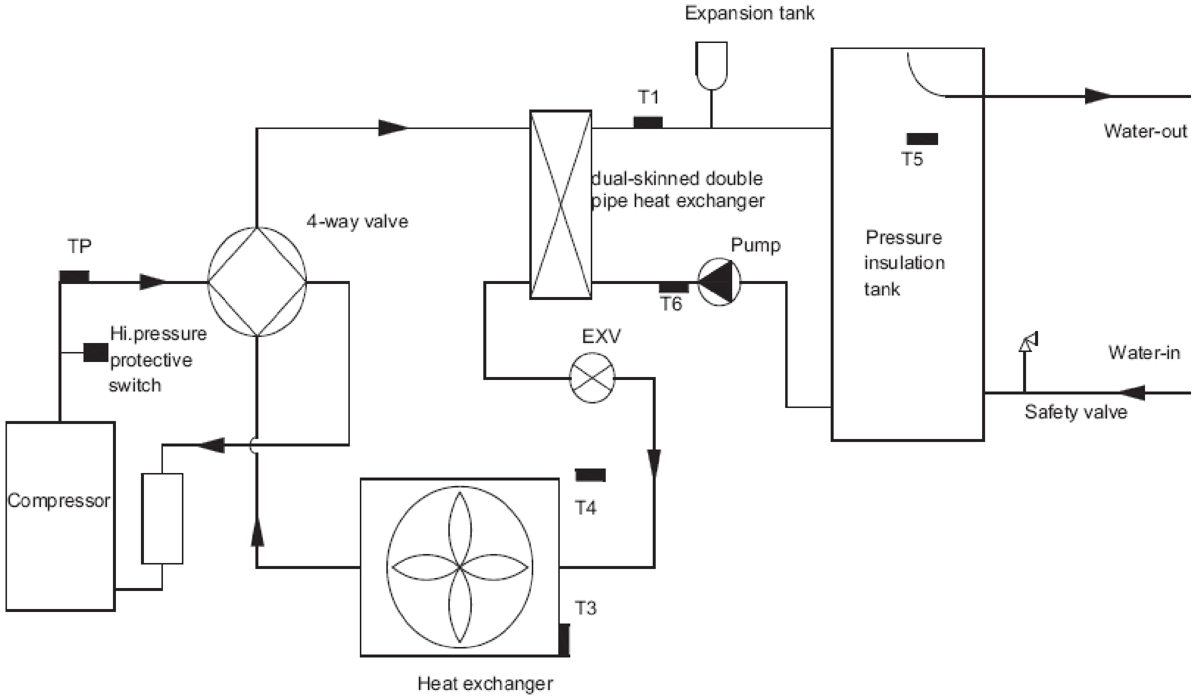
Do not install the remote controller in a place exposed to direct sunlight or close to a heating source, such as a stove.

Ensure that batteries are loaded correctly in terms of positive and negative poles.

This manual is subject to changes due to technological improvement without further notice.

3. System schematic diagram of whole unit

Models: ALLWH3.2 KW ALLWH5.0 KW ALLWH7.2 KW



5. Electrical wiring

5.1 Attention

- The water heater is to be connected correctly in terms of power supply and rated power voltage.
- The power supply circuit of the water heater must be earthed. The power cord is to have a suitable earth and all external earthing cables are to be properly connected.
- The construction of the wiring should be carried out by professionals in accordance with the circuit diagram.
- Earth leakage protection devices must be in accordance with the requirements of relevant national technical standards.
- The power cord and the signal line should be laid in such a manner so as to not interfere with each other, and should not come into contact with the connecting pipe and the valves.
- The unit is not equipped with a power cord. Please refer to the prescribed power specifications for selecting the power cord, whilst connecting between two lines is not allowed.
- Check whether all the connections are correct before powering the unit.

.

5.2 Power Specification

Item / Model	Power Supply	Min. wire size(mm^2) (Metal pipe &synthetic resin pipe wire)		Manual Switch(A)		RCCB	Model
		Size (Continuous length≤30m)	Earthing	Capacity	Fuse		
ALLWH3.2 KW ALLWH5.0 kW	220~240V, 50Hz	1.5	1.5	20	15	30mA, below 0.1 sec	LBC-16-1-CP
ALLWH7.2 KW	220~240V, 50Hz	2.5	2.5	30	25	30mA, below 0.1 sec	LBC-16-1-CP

Note:

1 The power cord type designation is H07RN-F.

2 Wire size and continuous wire length in the table above only available for the case of the voltage decreasing range not exceeds than 2%.

3 If the continuous wire length value larger than the one of the table, please choose its size in compliance with the relevant rules.

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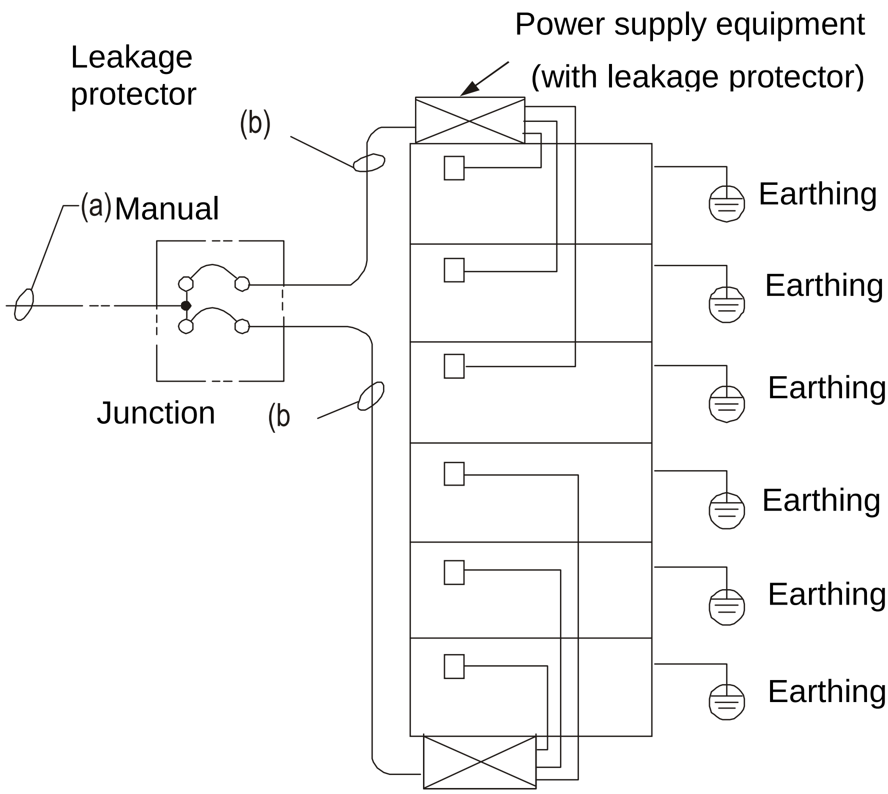
5.3 Cable Size and Pieces

Name	Pieces	Length	Cable Diameter
Water pump power cord	2-core	≤ 50 m	2.5 mm^2
Electric-heating power cord	2-core	≤ 50 m	2.5 mm^2
Circulating water pump power cord	3-core	≤ 50 m	2.5 mm^2
Four-section type water volume controller cord	5-core	≤ 20 m	1.0 mm^2
Communication cord (shielded)	5-core / 3-core	≤ 50 m	0.75 mm^2
Water flow switch cord	2-core	≤ 50 m	1.0 mm^2
Water pressure switch cord	2-core	≤ 50 m	1.0 mm^2
Solenoid valve cord	3-core	≤ 50 m	1.5 mm^2

Note: When the power cord and the controlling wire run parallel, please place each wire in its respective tube, leaving suitable distance between the lines.

5.4 Power supply wiring.

A. Power supply equipment application



Note: Although there is a leakage protector in the electric control box of the unit, for reasons of additional security it is required that a leakage protector be installed in the external electric control box of the unit according to the above diagram.

B. Cable diameter selection

The power supply wiring refers to the wiring to the main line (a) of junction box and the wiring (b) to the power supply equipment. Please select the cable diameter according to the following methods

1) Diameter of the main line (a):

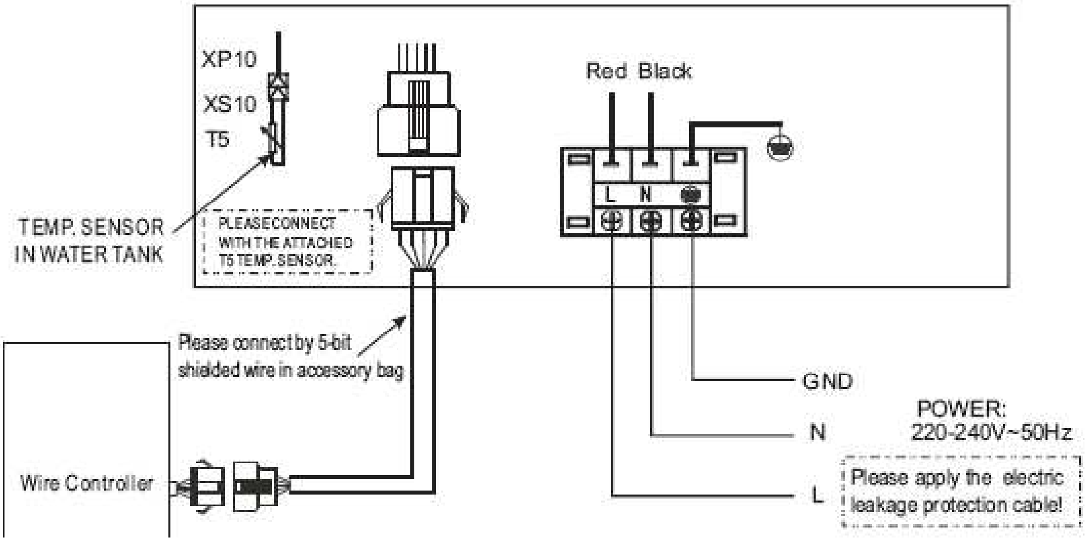
Determine from the power supply specification table according to the sum of horsepower of the unit.

2) Diameter of the wiring from the junction box to the power supply equipment:

When the water heaters are less than 5 sets, the diameter of the wiring from the junction box to the power supply equipment should be the same as the main line (a); when the water heaters are more than 6 sets, the power supply equipment should have two sets of electric control boxes and the diameter should be determined from the power supply specification table according to the sum of horsepower of the units connected via the electric control box.

5.5 Electrical connection diagram.

Electrical Wiring diagram for Models :ALLWH3.2 KW, ALLWH5.0 KW, ALLWH7.2 KW

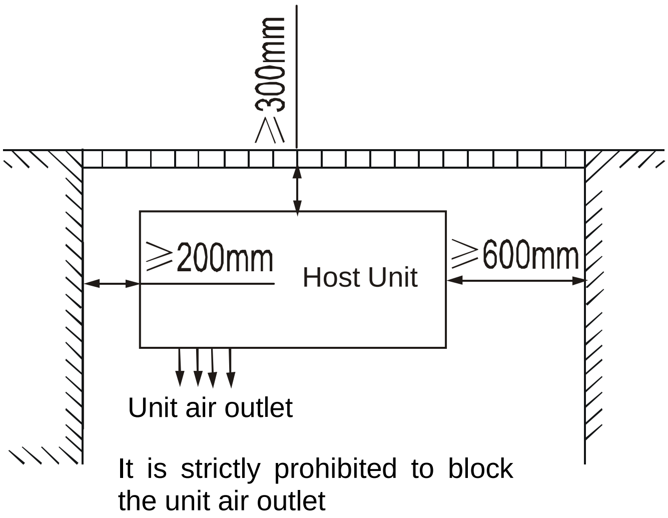


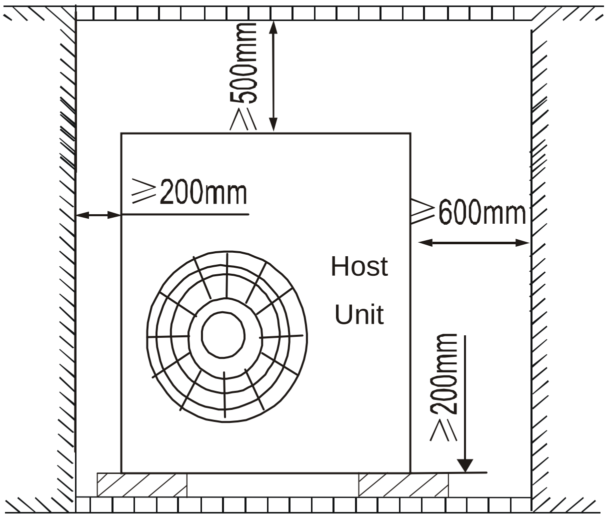
6. Outdoor Unit Installation

Installation space requirement

a. Ensure there is sufficient space for the maintenance of outdoor unit

b. A distance of no less than 200mm should be maintained between the bottom of the outdoor unit and the ground or bracket for the installation of the duct pipe.





c. Distance between anchor bolt is shown as follows

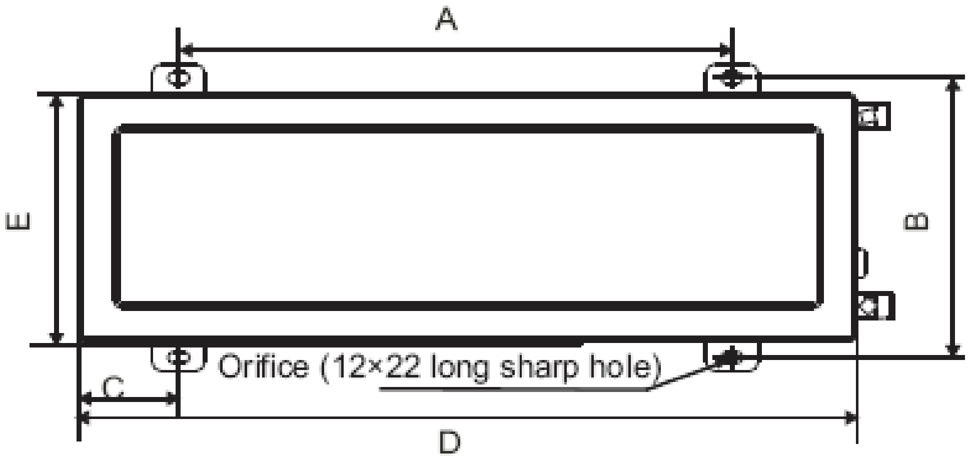


Fig.4-1

Table: 4-1 unit:mm

Model	A	B	C	D	E	F
ALLW3.2Kw	563	295	100	790	275	765
ALLW5.0Kw	563	295	100	790	275	765
ALLW7.2Kw	560	335	140	845	335	945

7. Water Pipe Installation

7.1 Installation material preparative

Installation Materials		
Name	**Qty**	**Specification and Usage**
Water pipe, flexible joint	Decided by the project needs.	Metal, non-metal composite pipes; PPR pipe, polyethylene-aluminium composite pipeline, etc.
Hydraulic gauge	One per unit	Scale 0.2bbar; Measure 8bar
Ball valve	One per unit	Water tank inlet pipeline
Insulation material for hot water pipeline	According to the length of the hot water pipeline.	Heat preservation material for hot water pipeline
Insulation material for refrigerant pipeline	According to the length of the refrigerant pipeline.	Insulation material for refrigerant pipeline
Electric Control Box	One	Power supply connection; Install the wired controller, ammeter, etc.

7.2 Remarks:

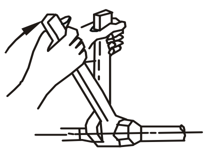
a. The pipe length between host unit and water tank should be a maximum of 5m, and the height difference a maximum of 3m. If exceeded, this could lead to overloaded water pump, insufficient circulation of water and affect high pressure protection of host unit.

b. Aluminium-plastic or PPR pipes are recommended for connection and should be wrapped with a heat insulation layer and protection layer such as thin Al sheet and plain galvanized steel sheet in case of exposure.

c. Connection and installation of the unit pipeline:

When connecting the inlet and outlet pipeline of the unit, use two pipeline grips to secure the two parts to be connected, to ensure that inlet and outlet pipelines do not rotate (see diagram below).

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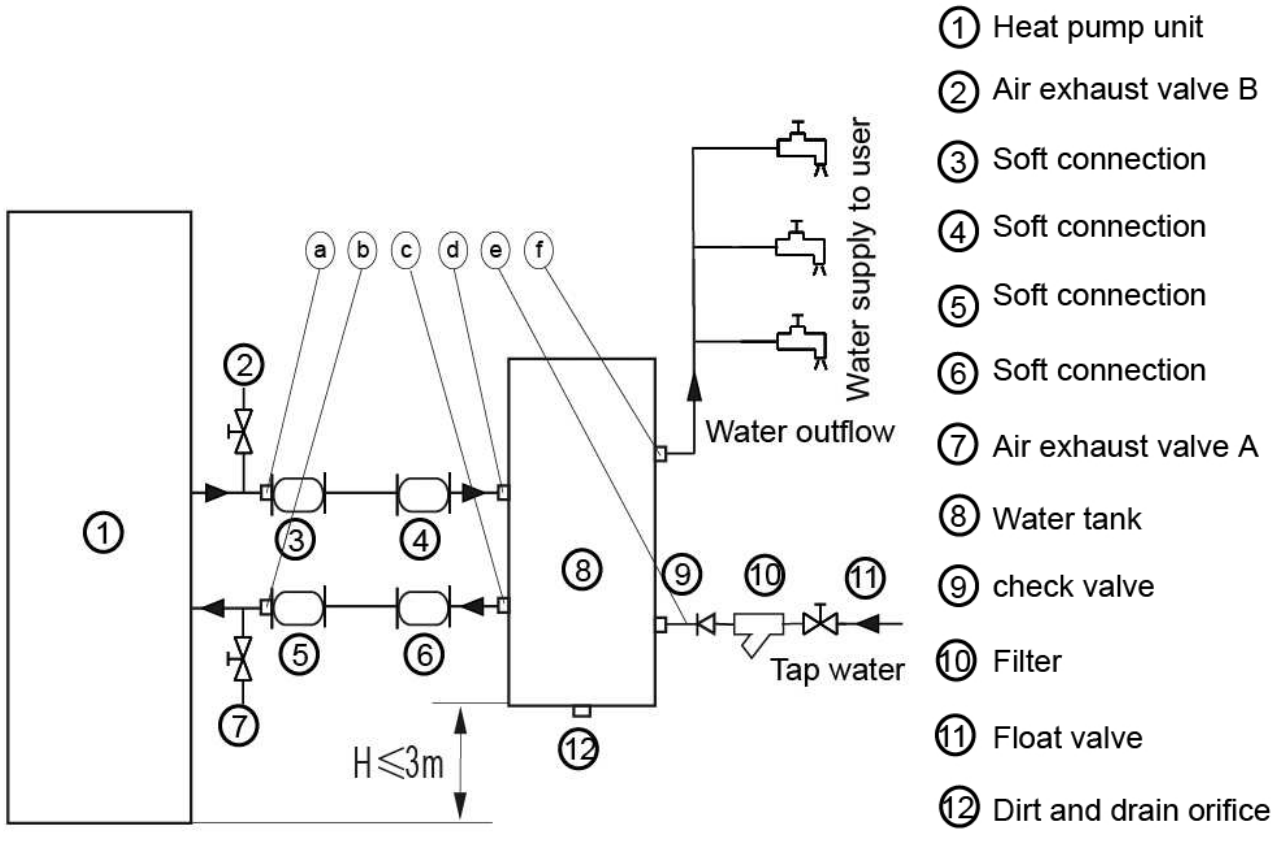


d. Prevent air, dust or other impurities from entering the pipeline system when installing the connecting pipe.

e. The water inlet and outlet pipeline must not be installed until the water heater is securely fixed in position.

f. The water outlet pipe must be insulated with thermal insulation material.

7.3 Connecting diagram of the water heater



No	Name	Connective pipe specification
a	Circulating water outlet of main unit	DN20
b	Circulating water inlet of main unit	DN20
c	Circulating water outlet of water tank	DN20
d	Circulating water inlet of water tank	DN20
e	Cold water inlet	DN15
f	Hot water outlet	DN15

Part 4
Trial Operation

1. Checklist before the trial operation

Ensure that:

1.1 The entire installation is complete.

1.2 Water heater is installed correctly.

1.3 Pipelines and wiring are correct.

1.4 All accessories are installed correctly.

1.5 The drainage is smooth, without kinks in the pipe

1.6 The thermal insulation is sound.

1.7 The earthing wire is connected correctly.

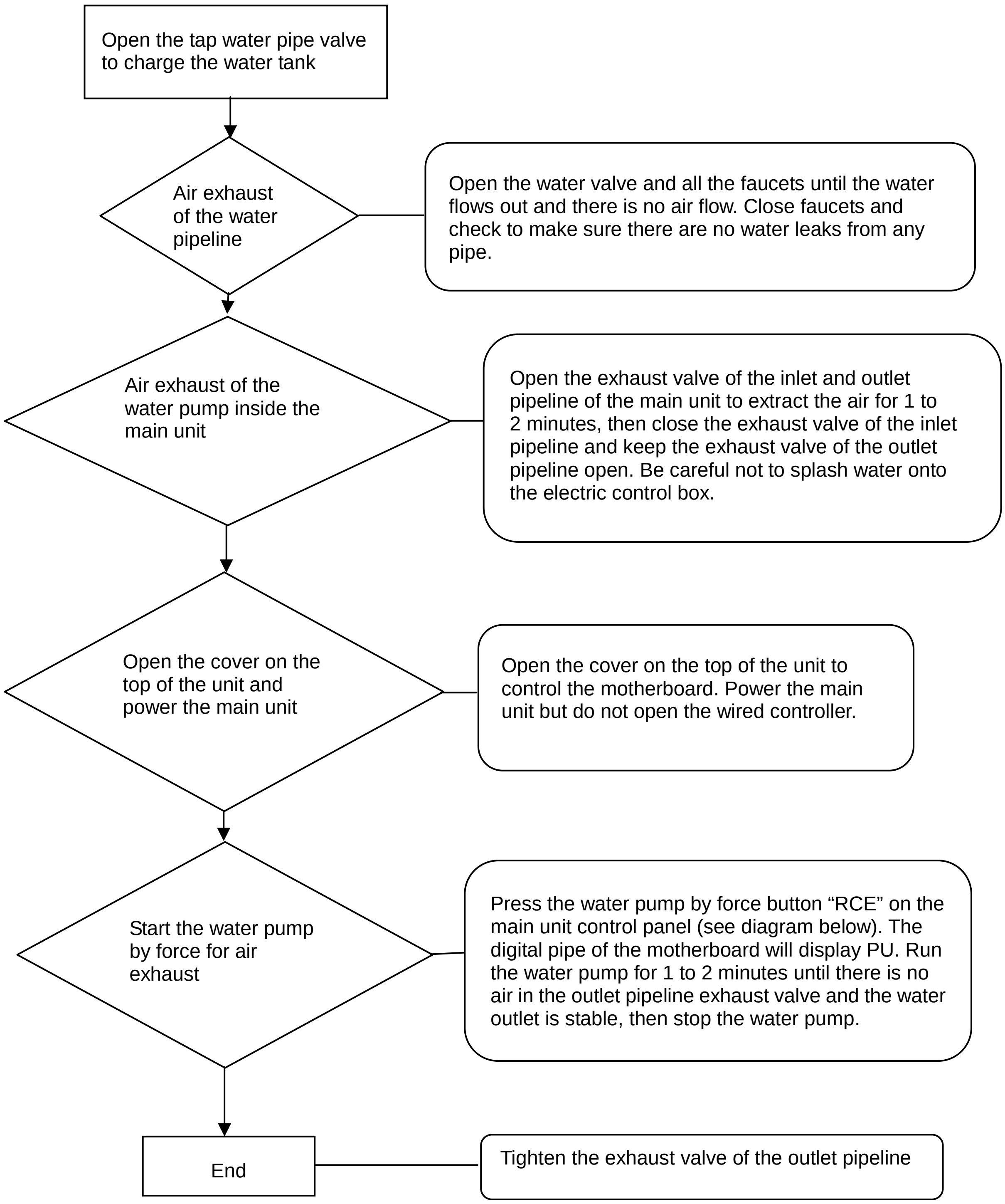
1.8 The power voltage is consistent with the rated voltage of the heater.

1.9 There is no obstruction of the air inlet and outlet of the unit.

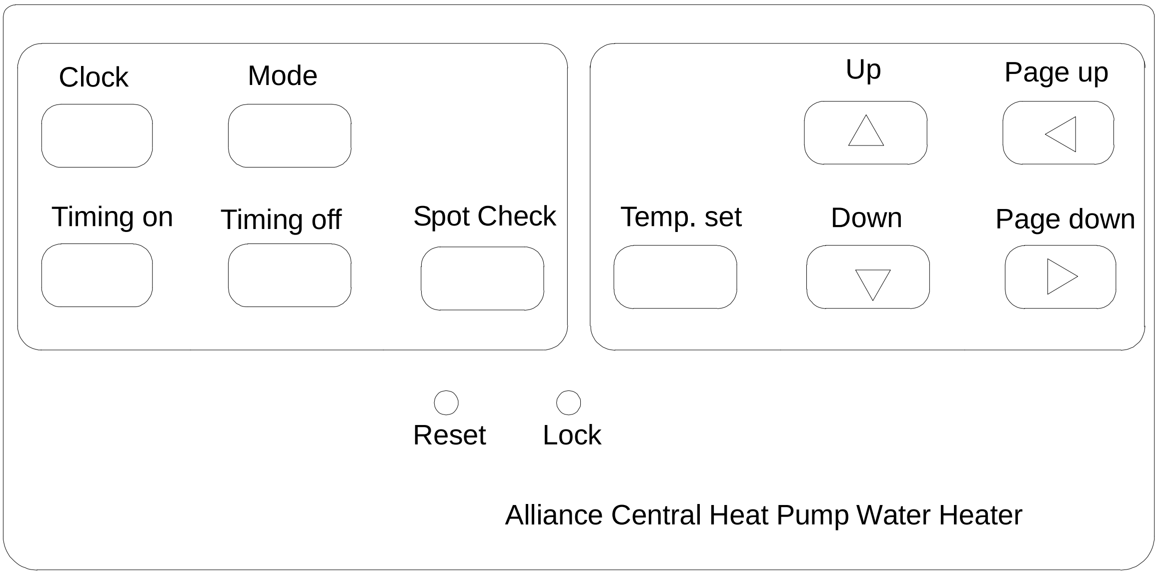
1.10 The leakage protector is working effectively.

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2. Water Tank water resupplying and Water Pipe and Pump Air Exhaust (Artesian Pressure Water Tank)



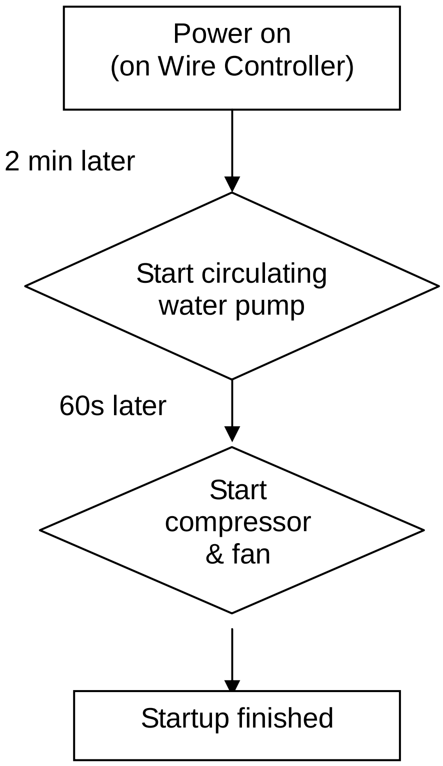
3. Wire Controller ALL REMOTE WATER/BE



Function:

- Auto Startup Timed Startup Manual Startup
- Water Temp. Set
- Water Temp. Display Spot Check
- Power-down Memory

4. Startup Process



5. Trial Operation Check

Control the water heater operation by wired controller (from accessory) and check the following items in accordance with the User's Manual (If any error, please eliminate it according to the error code explanation and analysis at the end of this manual.):

Check:

5.1 Whether the wired controller switch is normal.

5.2 Whether the functional buttons of the wired controller are normal.

5.3 Whether the indicator lights are normal.

5.4 Whether the manual operation button is normal.

5.5 Whether the drainage is normal.

5.6 Test whether the unit operates normally in the heating mode.

5.7 Whether the outlet water temperature is normal.

5.8 Whether there is vibration or abnormal sound when operating.

5.9 Whether wind noise and condensed water could affect neighbors.

5.10 Whether there is refrigerant leakage.

6. Corresponding Operation Explanation

6.1 About Three-minute Protection

If you re-run the unit or turn on the manual switch after the unit stops, the unit will not start within three minutes because of the self-protection function of the compressor.

6.2 Auto Adjustment of Fan Motor

If the ambient temperature is high when the unit is operating, the fan motor of the unit might be on the low-wind operation.

6.3 Defrosting in the Air Supply Operation

When there is frosting during the heat supply, defrosting will operate automatically to improve the heating effect (about 2-10 minutes).

The fan motor will stop running when defrosting.

6.4 Operating Conditions

For best results from water heater, it is to be operated at outdoor temperatures between -7 ℃ ~ 43 ℃. Since there are delicate electronic components inside the unit, it is strictly prohibited to use water from lakes, rivers or untreated groundwater.

6.5 About Power off

A All operations stop when the power is off.

B The operation indicator of the wired controller will flash slowly for several seconds for notifying re-start after power off.

C If any error action occurs in the operation (e.g. due to factors such as lightning or radio interference), cut off the manual power switch, re-start and press the On/Off button again.

6.6 Power-down Memory

The wired controller will memorize the unit state automatically before power-off of the unit or the wired controller, and send the On/Off signal to the water heater. This ensures that the unit will operate according to the originally set state when switched on again.

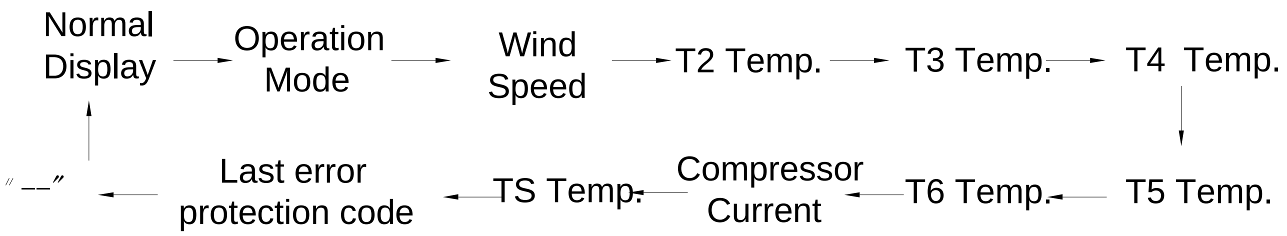
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7. Error Code Explanation and Analysis

Code	Code Explanation	Cause Analysis	Solution
E2	Communication failure	Communication failure between the main unit and the wired controller	Connect the main unit with the A, B, P, Q and E lines of the wired controller correctly.
		Electromagnetic interference because communication line is not the shielded line	Replace the communication line with the shielded line.
		Damage of the sensor	Replace the sensor
E4	Water temp.sensor failure in the water tank	The T5 port between the sensor and the motherboard is loose	Insert the port correctly
		Sensor damage	Replace the sensor.
E5	Condenser Temp. sensor failure	The T3 port between the sensor and the motherboard is loose	Insert the port correctly
		Sensor damage	Replace the sensor.
E6	Outdoor ambient temp. sensor failure	The T4 port between the sensor and the motherboard is loose	Insert the port correctly
		Sensor damage	Replace the sensor.
E7	Sensor failure at water pump outlet	The T6 port between the sensor and the motherboard is loose	Insert the port correctly.
		Sensor damage	Replace the sensor.
Ed	Sensor failure at the double-pipe refrigerant outlet	The T2 port between the sensor and the motherboard is loose	Insert the port correctly.
		Sensor damage	Replace the sensor.
		Leakage of refrigerant	Check the leaking place, mend by welding, exhaust the air and add refrigerant again.
P1	System high pressure protection	The circulating pipe between the water tank and the main unit is too small	Use the DN 20 pipe
		The circulating pipe between the water tank and the main unit is too long	The length of the connecting pipe should be ≤ 5 m
		The height difference between the water tank and the main unit is too large	The height difference should be ≤ 3 m
		There is air in the water pump	Exhaust the air (see Chapter Three)
		The water pump is not started	Check whether the water pump is damaged
		The capillary is blocked off (small possibility)	Weld the capillary and add refrigerant. Blow it clear by high pressure air or replace it.
		No water in the water tank and the tap water supply is stopped	Shut down the unit and start when the tap water supply is normal
P2	System current protection	The circulating pipe between the water tank and the main unit is too small	Use the DN 20 pipe
		The height difference between the water tank and the main unit is too large	The height difference should be ≤ 3 m
		There is air in the water pump	Exhaust the air
		The water pump is not started	Check whether the water pump is damaged
		The capillary is blocked off (small possibility)	Weld the capillary and add refrigerant. Blow it clear by high pressure air or replace it.
P8	Protection for the over-high temperature at the outlet of the condenser (T2 ≥ 60 □)	Water pump is not started	Cut off the power supply, remove the bolt on the back of the water pump and turn the water pump axis
		There is air in the water pump	Exhaust the air
		The water pump is not started	Check whether the water pump is damaged
Pb	Anti-freezing protection	Prevent PTE cracking by freezing in the winter	Normal protection, no need for treatment.

8. Spot Check

Main Control Board Spot Check



Wire Controller Spot Check

Outlet Temp. T1 -> Outdoor Pipe Temp. T3 -> Ambient Temp-> Compressor A Current -> Compressor B Current-> Error-> Error Protect